Connecting Alaska With Middle Mile DELIVERING GIGBYTES

PACIFIC DATAPORT

August 2021 | Pacific Dataport, Inc. | Anchorage, Alaska



DESIGN OBJECTIVES

- Statewide Coverage
- Low Cost per Mbps
- High Capacity (lots of Mbps)



Middle Mile Concepts

- Speed isn't the issue (GEO Satellite can do over a 1 Gbps with higher speeds coming)
- Last mile is concerned with speed
- Goal is volume (GB), just like an oil pipeline
- Do that with a lot of Mbps
- Must provision enough middle mile to provide volume required



Alaska Plan Economics

| Middle Mile Cost/Mbps | \$10 | \$50 | \$100 | \$126 | \$200 | \$400 | \$600 |
|------------------------------|----------|------|---------------|-------|--------------|--------------|--------------|
| Middle Mile Cost/Customer | \$5 | \$25 | \$49 | \$62 | \$99 | \$198 | \$296 |
| Net to ISP | \$57 | \$37 | \$13 | 0 | (\$37) | (\$136) | (\$234) |
| Annual Subsidy Required | 0 | 0 | (\$4,542,222) | 0 | \$13,235,556 | \$48,791,111 | \$84,346,667 |
| | | | | | | | |
| Allowable Charge 25x3 | \$112.00 | | | | | | |
| Last Mile Expense/Customer | \$50.00 | | | | | | |
| Volume GB/Customer | 160 | | | | | | |
| Capacity Req'd Mbps/Customer | 0.5 | | | | | | |
| Households | 30,000 | | | | | | |



Other State's Economics

| Middle Mile Cost/Mbps | \$10 | \$50 | \$100 | \$200 | \$400 | \$600 | \$800 |
|------------------------------|----------|-------|--------------|--------------|---------------|---------------|---------------|
| Middle Mile Cost/Customer | \$14 | \$71 | \$142 | \$284 | \$568 | \$852 | \$1,136 |
| Net to ISP | \$48 | (\$9) | (\$80) | (\$222) | (\$506) | (\$790) | (\$1,074) |
| Annual Subsidy Required | 0 | 0 | \$28,791,111 | \$79,902,222 | \$182,124,444 | \$284,346,667 | \$386,568,889 |
| | | | | | | | |
| Allowable Charge 25x3 | \$112.00 | | | | | | |
| Last Mile Expense/Customer | \$50.00 | | | | | | |
| Volume GB/Customer | 460 | | | | | | |
| Capacity Req'd Mbps/Customer | 1.4 | | | | | | |
| Households | 30,000 | | | | | | |

What Does Middle Mile Cost?

- Fiber/Microwave ~\$120K per mile possibly more
- Terra \$350M
- Quintillion \$250M
- LEO Satellite Middle Mile ~\$15,000 per served location ~\$650/Mbps
- GEO Satellite Middle Mile \$200M <\$99/Mbps

LEO Satellite Direct to Consumer \$499 plus \$99/month (unlimited data, >100X20 Mbps)



Things to Consider in Middle Mile Programs

- Cost per Mbps
- Breadth of Coverage
- Time to Completion
- Redundancy
- Business Sustainability

Our Approach

- Combined LEO/GEO middle mile to provide low latency where required with much lower cost
- Built in redundancy
- GEO provides redundancy statewide for existing networks
- Ka Band HTS/VHTS
- First Satellite Aurora 4A Launch Mar 2022 ~7.5-10 Gbps
- Second Satellite Aurora 4 ~80-100 Gbps Q1/2025

Broadband Policy

- Broadband policy makers must concern themselves with technology/cost
- Policy decisions can handicap technologies that may offer viable solutions
- Consumers are concerned with speed, capacity, price and when--latency is a distant fourth
- Policy makers must also look at the totality of funds:
 - USAC Alaska Plan Payments ~\$180M/yr
 - Rural Health Care Payments ~\$110M/yr
 - E-rate Payments ~\$80M/yr
 - USDA grants and loans \$81M since 2018
 - NTIA grants and loans ~\$65M to Terra
- How much do we need? At \$75-120K plus per household, A LOT!



Elon Musk at Mobile World Congress

Musk claimed it would cost USD \$5-10B before Starlink turned cash flow positive and that he would invest "perhaps" up to USD \$30B to remain competitive thereafter. Interestingly, he argued that "we will have to keep investing a great deal after being cash flow positive in order to not be made irrelevant by lower-cost GEO satellites". Musk also mentioned he wants to offer his services at prices comparable to GEO satellites. ~ June 2021

Thank you!

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